

REMARKS

Reconsideration is respectfully requested in view of the foregoing amendments and the following remarks.

By this amendment applicants have cancelled claims 1 and 3, and amended claims 2 and 4-10. Applicants have also added new claims 12 and 13. The amended claims and the new claim are all fully supported in the specification.

In new claim 12, the “,” after “liquid” has been deleted, and it is now clear that the washing liquid contains the compounds affecting the expansion properties. Also in the new claim 12 it is now clear that the pH of the washing liquid is being measured. The phrase, “oxidizing agent, wash” is not included in new claim 12.

The phrase “at least one representative of the group comprising” has been deleted from claims 3 and 5-10.

In view of the foregoing amendments to the claims and new claim 12, it is respectfully requested that the rejection under 35 USC 112, second paragraph, has been overcome and should be withdrawn.

Claims 1-11 stand rejected under 35 USC 103(a) over Kondo et al. This rejection is traversed.

U.S. Patent 4,244,934 (Kondo et al.) discloses a process for producing a flexible graphite product which comprises the steps of subjecting graphite particles to oxidizing treatment with nitric acid, washing the treated graphite particles with water, contacting the washed graphite particles with an antioxidant, comprising at least one metal salt of a boric acid ester as the specific antioxidant, heating the resulting graphite particles to obtain expanded graphite masses and compressing the expanded graphite masses to form a flexible graphite product.

The claimed invention distinguishes over the disclosure of Kondo et al. reference by not washing the treated graphite particles with water but with a washing liquid containing the specific compounds affecting the expansion properties of the sulphuric acid-graphite particles, and also by not contacting the washed graphite particles with an antioxidant comprising at least one metal salt of a boric acid as defined therein.

Since Kondo et al. also does not provide any information whatsoever with regard to the expansion volume, the expansion rate or that the average expansion coefficient of the expandable sulphuric acid-graphite particles can be increased or lowered in a controlled

manner in accordance with the claimed method, the amended claims comprise an inventive step which distinguishes over the Kondo et al reference. With respect to the modification of said expansion properties, reference may be made to the examples of the present application. Accordingly the §103(a) rejection has been overcome and should be withdrawn.

Claims 1-11 stand rejected under §103(a) over Yamada et al. This rejection is respectfully traversed.

U.S. Patent 4,146,401 (Yamada et al.) discloses a method for manufacturing a graphite material having compressibility and a recovering property, which comprises treating said particles with an acid, washing the acid-treated graphite particles with water or an aqueous medium, treating the washed graphite particles with a binder, consisting essentially of an aqueous solution of aluminium dihydrogen phosphate, expanding the thus treated graphite particles to 20 to 70 times, in terms of bulk density ratio of the original graphite, by heating and molding the expanded graphite particles under the application of pressure.

The claimed invention distinguishes over the disclosure of Yamada since the acid-treated graphite particles are not washed with water, but instead with a washing liquid containing the specific compounds affecting the expansion properties of the graphite particles. In addition, in the claimed invention the washed graphite particles are not treated with the binder solution as disclosed in Yamada. Furthermore, the treated graphite particles are not expanded and they are not molded under the application of pressure as taught by Yamada.

Therefore, the claimed invention distinguishes over Yamada since one of ordinary skill in the art is not taught by Yamada that it is possible in a controlled manner to influence the expansion properties of the sulphuric-acid graphite particles by using specific compounds in the wash liquid to wash the sulfuric-acid graphite particles produced by the reaction of graphite particles with sulphuric acid in the presence of an oxidizing agent to a point where the pH value of the washing liquid, separated from the washed graphite particles, ranges from 2 to 8. Therefore, the subject-matter claimed is unobvious over the disclosure of Yamada et al. Since the §103(a) rejection has been overcome its withdrawal is solicited.

Claims 1-11 stand rejected under §103(a) over Greinke et al. This rejection is

traversed.

Greinke et al. discloses a process for manufacturing particles of intercalated graphite, having no greater than about 1.5% average titratable sulphuric acid by weight, comprising treating the particles of graphite with an intercalant as defined in section (a) of claim 1 of Greinke et al., washing the intercalated particles of graphite with water, drying the washed particles and contacting said particles of graphite before drying with an effective amount of an agent composed of an organic molecule, having a long chain hydrocarbon group with at least 8 carbon atoms and a polar functional end group.

By contrast, the claimed invention distinguishes thereover by not treating the graphite particles with the defined intercalate and then washing the intercalated particles with water, and by using a washing liquid comprising specific compounds affecting the expansion properties of the sulphuric acid-graphite particles, which are not disclosed in Greinke et al. Furthermore, the claimed invention is not made obvious by Greinke since there is no disclosure provided to the skilled person that by using the specific compounds recited in claim 1 in the washing liquid, which provides a pH ranging from 2 to 8 in the washing liquid, when separated from the washed graphite particles, to achieve a controlled modification of the expansion properties of the graphite particles. Therefore, the subject-matter claimed is clearly unobvious over the teaching of Greinke et al. Accordingly, the §103(a) rejection has been overcome and its withdrawal is solicited.

Claims 1-11 stand rejected over Mercuri. This rejection is traversed.

Mercuri discloses a catalyst support material useful in a membrane electrode assembly. As is disclosed in paragraphs [0030] and [0031] of Mercuri, prior to, or during, or immediately after, intercalation an expansion aid may be applied to the graphite particles to improve their properties, namely by reducing the exfoliation temperature and increasing the expansion volume. The expansion aids used according to Mercuri are organic materials, namely, carboxylic acids.

The claimed invention distinguishes over Mercuri by using completely different compounds for affecting the expansion properties of the sulphuric acid-graphite particles. Since this document does not provide the skilled person with any hint whatsoever as to which compound should be used to provide either an increase or a lowering of the expansion volume, the expansion rate and the average expansion coefficient, the skilled person would not be directed to the claimed subject-matter.

Therefore, the claimed invention distinguishes over the teachings of Mercuri. Thus, this rejection has been overcome and its withdrawal is accordingly solicited.

Claims 1-11 stand rejected over British 2,128,971. This rejection is traversed.

British Patent Application 2,128,971 discloses a method of purifying a graphite compound obtained by treating graphite with sulphuric acid under oxidizing conditions and washing the product with water to replace the free sulphuric acid present therein. According to this method the water-washed product is further contacted with water, either at a temperature above 100°C under superatmospheric pressure, or at a temperature above 30°C in the presence of dissolved nitric acid or a nitrate.

The claimed invention distinguishes over British '971 by not washing the product with water, but with a washing liquid containing the specific compounds affecting the expansion properties of the graphite particles, which do not include either nitric acid or a nitrate which are taught by British '971. Since the object of British '971 is to reduce the corrosion of expanded graphite compounds by subjecting the pre-exfoliated, water-washed graphite compound to a further treatment with water and with dissolved nitric acid or a nitrate, it cannot be said provide the skilled person with any information or direction whatsoever that it is possible, in a controlled way, to influence the expansion properties of the sulphuric acid-graphite particles by using the specific compounds referred to in applicant's claims. Accordingly, the §103(a) rejection has been overcome and should be withdrawn.

Claims 1-11 stand rejected over Japanese application 2-153811. This rejection is respectfully traversed.

As far as Japanese Patent Application 2-153811 is concerned, this document has also been cited during the examination proceedings before the German Patent Office. Applicants therefore submit a German translation of this document.

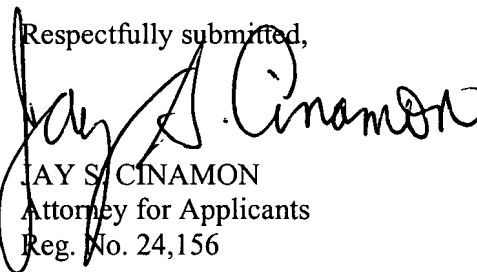
Japanese '811 discloses an expandable graphite and method for its manufacture. The method comprises a two-step-treatment, namely, first washing the sulfuric acid-graphite with water until the amount of the free sulfuric acid, corresponding to the dry mass of the washed product, comprises 1 mol/kg. Thereafter, in a second step the sulfuric acid still present is neutralized with an aqueous solution of an alkali metal compound. As alkali metals, namely sodium and potassium, can be used. However, Japanese '811 does not provide any specific examples for using the alkali metal salts of organic acids.

Furthermore, the method disclosed in Japanese '811 is used to control the amount of free sulfuric acid in the expandable graphite, i.e. to neutralize the sulfuric acid, and not, in any manner, to modify the expansion properties of the obtained expandable graphite. Therefore, the claimed invention distinguishes over Japanese '811. This rejection has been overcome and should be withdrawn.

The issuance of a Notice of Allowance is respectfully solicited.

Please charge any other fees which may be due, and which have not been submitted herein, to our Deposit Account No. 01-0035.

Respectfully submitted,



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